

Utilizing TWI Job Instructions to Prepare Disabled Young Adults for School and Work Mid-Pandemic

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ABSTRACT

We must help the child to liberate himself from his defects without making him feel his weakness

~ Maria Montessori

Individuals with intellectual and developmental disabilities have a higher prevalence of comorbidities and poorer COVID-19 outcomes (Turk 2020). Hospitalized individuals with Down syndrome (DS) are younger than their non-DS counterparts (Malle 2020) and are ten times more likely to die from COVID-19 (Clift 2020). However, COVID-19-related lockdown of adults with DS exacerbates depression with worsening functional status (Villani 2020). Generally recognized infection prevention and control (IP) standards-of-care can protect disabled individuals from exposure to SARS-Cov-2 and, with appropriate instruction, COVID-related risks can be mitigated. In one observational study, a decrease in the incidence of SARS-CoV-2 infections in individuals with DS from March-Sept 2020 was attributed to the high degree of commitment to imitate and repeat IP tasks related as “important or beneficial” (Ortega 2020). Standardized methods such as Training Within Industry (TWI) Job Instruction (JI) can be used to teach and verify competency in novice disabled workers, including disabled students transitioning from school to work. The environmental and occupational factors associated with occupational and pedagogical transmission of SARS-CoV-2 have been well described and exposure risks can be reduced with a combination of social distancing, masking, and hand hygiene (Callea 2020). These three tasks have detailed validated job instructions that can be utilized to train disabled students to safely practice appropriate social distancing, masking, and hand hygiene so that they may safely learn in the school environment and prepare to enter the work environment. These JIs can continue to protect young adults with DS post-COVID since seasonal flu is transmitted in a manner similar to SARS-CoV-2.

FIGURE 1. WWII TWI JOB INSTRUCTION – POCKET CARD



BACKGROUND

See one, do one, teach one.

Training Within Industry (TWI) was an initiative developed during WWII to address the need to quickly train inexperienced workers to perform complex redundant tasks to satisfy the high output needs to support war efforts on multiple fronts on multiple continents. Job Instruction (JI) was one of four basic training programs developed by the U.S. War Manpower Commission to train inexperienced workers. Job Instruction is a standardized process to both: train-the-trainer and train-the-worker so that workers understand the importance of each step of a multi-stop process once taught by a TWI trained instructor.

The original WWII-era TWI JI pocket card (FIGURE 1) standardizes how complex tasks are prepared to be taught to novice workers. First, there is a Time Table; second there is a Job Breakdown; then there are the required materials; and finally, the actual working conditions are simulated/prepared.

See one, do one, teach one is core to the JI with the instructor demonstrating the task by breaking down the job into important steps, with key points, and reasons at a pace individualized to the learner. Unsurprisingly, these same steps have been found to be effective in a wide-range of ages, skills, education, and abilities. Similar steps are followed in the Montessori classroom and in medical schools around the globe. *See one, do one, teach one* is similar to the Montessori three-period lesson which is similar to TWI Job Instructions where tasks are demonstrated (and explained) by the instructor and then performed (and restated) by the student before being performed independently (after mentored mastery).

Maria Montessori's (1870-1952) early work with mentally disabled children influenced her pedagogical approach of teaching practical life skills (self care, cleaning, etc.) by building an environment where students can learn skills modeled by their peers and practice these skills in a safe environment (safe to practice, safe to make mistakes). This same approach of experiential learning is used to teach young physicians where they first observe an experienced peer; then they practice the skill under supervision; before moving to independently performing the skill without supervision; and finally, teaching the skill to the new group of novices.

Montessori instruction, TWI Job Instruction, and physician training are all experiential methods of instruction and learning that partners one who has mastered a task with a novice. Materials are prepared, the task is demonstrated, and the student is allowed to practice the tasks, under direct supervision, allowing the student to make 'safe mistakes' while mastering multi-step processes.

See, FIGURES 2-4 for contemporary examples of JIs.

MATERIALS and METHODS

If the worker hasn't learned, the instructor hasn't taught

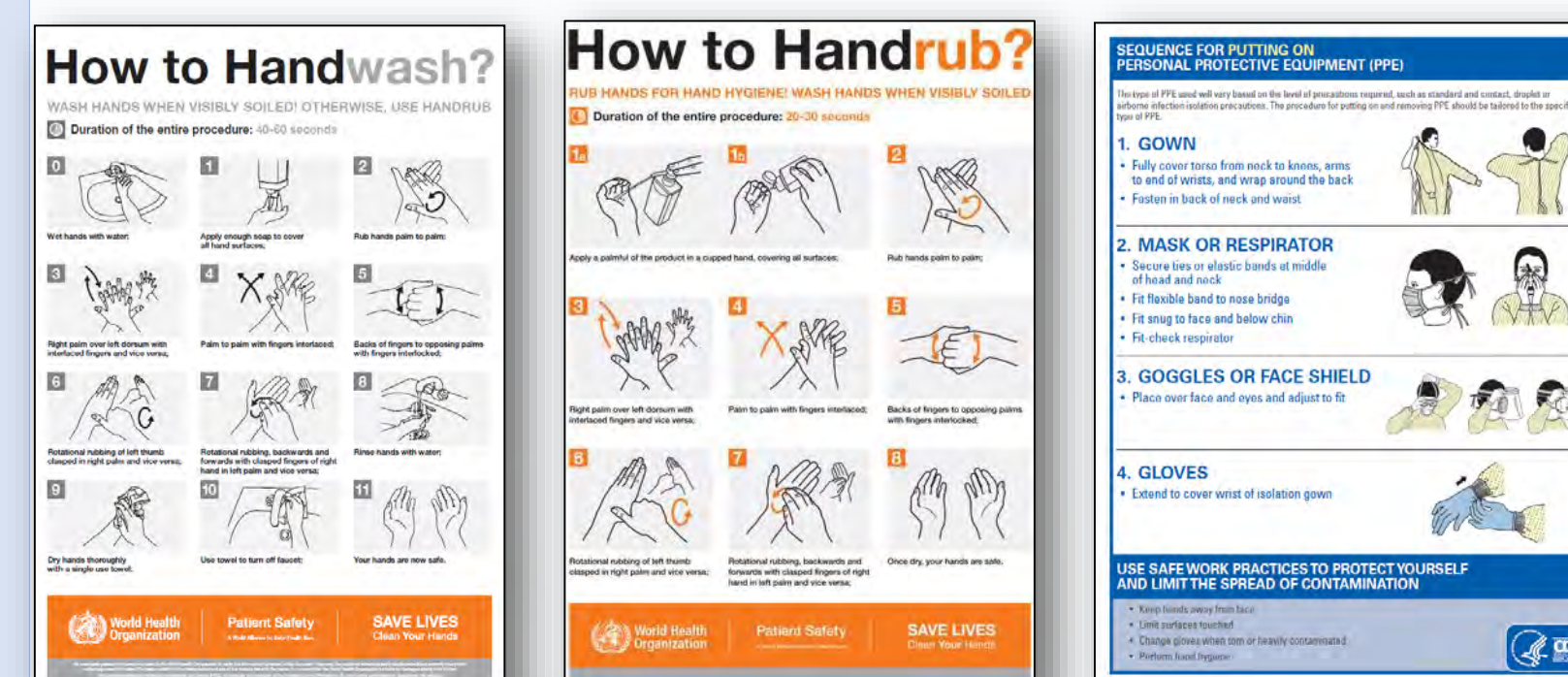
Mentored practice allows a novice to make safe mistakes while mastering a skill. TWI recognized the importance of job instructions built on detailed job breakdowns that break down each important step in a task to key points and reasons for the importance of each step, TABLE 1 (Graupp 2013).

Below are examples of the materials and methods to teach hand washing as an example of using TWI Job Instructions to teach disabled young adults important infection prevention tasks. TWI job instruction is individualized to the learner with practice repeating until, *YOU know, S/HE knows* (FIGURE 1).

TABLE 1. HAND WASHING – JOB BREAKDOWN

Important Steps	Key Points	Reasons
1. Wet hands	1. Without soap	1. Rinses away (if dry)
2. Apply soap	2. Cover surfaces	2. Kill all germs
3. Rub hands	1. Palm to palm 2. Palm to backs	1. Clean entire surface 2. Clean entire surface
4. Rub fingers	1. Thumbs 2. Interlocking 3. Backs of fingers to palm 4. Tips to palm	1. Most active part of hand 2. Sides of fingers cleaned at one time 3. Cuticles and knuckles 4. Under fingers
5. Rinse	1. Leave water on	1. Prevent recontamination
6. Dry	1. Use towel to turn off water	1. Prevent recontamination

FIGURES 2-4. SAMPLE JOB BREAKDOWNS FOR HANDWASHING, HANDRUB (ALCOHOL-BASED), AND DONNING PPE



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